

The DRAFT schedule for the remainder of 6 GeV running (between now and the final shutdown for the transition to 12 GeV) has been posted on the JLab website at:

[http://www.jlab.org/div\\_dept/physics\\_division/experiments/schedule.html](http://www.jlab.org/div_dept/physics_division/experiments/schedule.html).

We encourage all users to review the schedule and to discuss it with colleagues and JLab staff involved in its development. There will be two open, public discussions of the schedule: the first following a seminar presenting the schedule that will be held at 1 PM on Thursday, September 18, and the second at the January PAC meeting. There will also be discussions at various hall weekly and collaboration meetings. Your comments and thoughts about the schedule between now and early January and at the PAC meeting are welcome. Any written comments we receive will be shared with the Scheduling Committee and included in the information the PAC receives about the schedule for their deliberations in January.

The incoming JLab director, Hugh Montgomery, requested that we post the schedule now for your review and consideration. Prior to “finalizing” the draft schedule early in 2009, he will seek advice of the PAC and others. Specifically, Mont has indicated that his charge to the January 2009 PAC will request its comments on the 6 GeV running plan (in addition to recommendations on the 12 GeV proposals that will be the main focus of the PAC). A day will be set aside at the PAC meeting for this review, and will include both public and executive sessions. Mont will participate in both the public and executive session PAC discussions of the schedule. Following the PAC meeting, the laboratory will issue a revised DRAFT schedule that incorporates its response to that discussion and any further internal review deemed appropriate.

Once the “final draft” schedule has been issued, it will be subject to periodic revision depending on the details of laboratory funding and technical issues that may arise in the interim. We will post updates each year once a final budget for the year has been issued, and may post additional updates as our understanding of likely budget scenarios evolves. We will make every effort to have the issued schedules “firm” for at least the following six months, as has been tradition, but may be forced by budget developments to make adjustments. We will include to the extent possible guidance about potential budget consequences on the remaining program. The “style” of that guidance will be similar to what was done in the latest schedule release indicating the vulnerability of the April/May 2009 running.

Realizing this schedule fully will require that many things “fall right”. The core requirement will be overall laboratory operations funding at a level consistent with the 30 weeks/year average needed and with the hall operations and equipment construction necessary to complete it. This corresponds roughly to the lab receiving the President’s Budget request level of funding in FY09 and cost of living increases in subsequent years. It will also require that technical developments continue as foreseen for the accelerator itself – notably the restoration of 6 GeV maximum beam energy capability and the improvement in the polarized beam stability to the level needed by both the Hall A and  $Q_{\text{Weak}}$  experiments. Finally, a few of the planned experiments require major equipment developments where funding is not yet currently fully identified. These include the apparatus needed for: the  $g_2^p$  measurement (E08-027) and for the DVCS experiments on the proton (E07-007) and neutron (E08-025) that are planned for Hall A; the two photon exchange experiment (E07-005) in Hall B; and the  $N^*$  searches on polarized neutrons using the planned HDIce target (E06-101). In addition, both equipment modification and significant technical developments must take place before the DVCS and SIDIS measurements on the neutron (E08-015 and -021) can be mounted in Hall B. We will work with the proponents of these experiments to identify the needed funding.

The remainder of this memo provides an outline of how the schedule was developed and the biggest picture issues

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for the Nuclear Physics Experiment Scheduling Committee

### **Schedule Development and Issues:**

The current planning for the evolution of CEBAF has a major accelerator shutdown beginning in May 2011 (for ~6 months), followed by 6 months of additional 6 GeV running, and then the start of the one year final shutdown (in May 2012) and the beginning of 12 GeV commissioning (in May 2013). This means that there will be about 3 years of beam/hall operations between January

2009 and the start of 12 GeV science. The first issue to be resolved was the operations level to be used to develop the plan. What is presented assumes operations at a level such that we could deliver ~30 weeks/year (or ~80% of the traditional level of accelerator/hall ops). This level of operations is a compromise between completing important science and honoring our commitments to the User Community on the one hand, and making appropriate contributions from our operations budget toward the realization of the 12 GeV Upgrade. Unfortunately, if the budget continues to be the bumpy ride it has been over the past few years, running at this level may be an optimistic projection, and we will have to adjust running planned downward. However, we felt it was important to lay out a schedule that delivers as much physics as possible within the context of the 80% level of operations presented at the NSAC Long Range Plan meeting, and will seek the help of the user community in our efforts to realize as much of the program as possible.

Through careful planning the schedule posted includes more physics running in an average week of accelerator operations than has been the case historically. This has been possible because we were able to achieve a higher multiplicity (on average) by utilizing upgrade-driven downtime for installations and by scheduling multiple experiments using the same installation in sequence (reducing somewhat the priority placed on scientific merit in determining the running order of experiments).

The schedule was constructed by first asking, hall-by-hall, how we could carry out the highest priority science, including the usual issues of technical readiness and experiment sequences that use the same setup. This was then folded with a set of considerations that focused the plan. The earliest portion began by including experiments that were already on the “firm” schedule for FY08. This included the transversity experiments in Hall A, the e1- and egl-dvcs experiments in Hall B, and SANE in Hall C. We then put a major laboratory commitment to the  $Q_{\text{Weak}}$  experiment on the schedule by placing its completion as the last beam delivered on the last day of 6 GeV ops in Hall C, and then working backward. We also limited  $Q_{\text{Weak}}$  to a maximum beam current to 150  $\mu\text{A}$  to permit Halls A and B to run in parallel (and to limit susceptibility to target boiling problems). The remainder of the Hall C schedule was then filled by placing  $g_1^d$  and HKS running were fit between the already scheduled SANE and  $Q_{\text{Weak}}$  experiments. The

second major consideration was the completion of the Hall A parity program in the period between SANE and QWeak in Hall C. With these considerations in place, the remainder of the Hall A and B schedules were then laid out to maximize science using beam conditions consistent with available energies, currents and polarizations consistent with the experiments already scheduled.

The resulting schedule includes anticipated accelerator operation of:

- 32 weeks in FY09 (with a multiplicity of 2.7);
- 35 weeks in FY10 (with a multiplicity of 2.1);
- 28 weeks in FY11 (with a multiplicity of 2.8); and
- 27 weeks in FY12 (with a multiplicity of 2.5).

This averages to 30 weeks/year of accelerator operations, and improves significantly on the historical average hall multiplicity of 2.2 to 2.3.